DOCUMENT RESUME

ED 262 625 FL 015 295

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TITLE Language for Communication Engineers -- A Case Study in Two-Way Curriculum Development.
PUB DATE Apr 85
NOTE 23p.; Paper presented at a regional seminar of the SEAMEO Regional Language Centre (20th, Singapore, April 22-26, 1985).
PUB TYPE Reports - Descriptive (141) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS College Faculty; Communications; Course Descriptions; *Curriculum Development; *Engineering Education; English (Second Language); *English for Science and Technology; Foreign Countries; Higher Education; *Interdisciplinary Approach; Introductory Courses; Language Role
IDENTIFIERS *Electrical Engineering; *Language across the Curriculum; University of Technology of Papua New Guinea

ABSTRACT

An English scientific language course developed for the professional communications engineering program at the University of Technology of Papua New Guinea was designed to incorporate some of the principles of language across the curriculum and to accompany an introductory electronics course. The language and subject area courses are taught in close cooperation, with the subject textbook used as a text for the English course and with information from the text used to teach principles of classification and differentiation. Since the students are already generally proficient in English, only a few elements of grammar are emphasized. However, the language course does require students to practice writing long and short passages and to give brief oral presentations on technical subjects. Written assignments are used for assessment in both courses. The writing projects include full lab reports, reports on visits to the organizations that will sponsor students' field experiences later in the program, and explanations of electronic devices. Written examinations are also used, with the students contributing some of the problems. The program has been found to be successful, particularly in the degree of cooperation between the subject area and language faculty. (MSE)

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# Language for Communication Engineers - a case study in two-way curriculum development

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1985

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A paper presented at the 20th Regional Seminar of the SEAMEO Regional Language Centre, Singapore 22-26 April 1985

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ABSTRACT.

This is a case study of an EST course for a group of first year Communication Engineering students at the University of Papua New Guinea. The course is taught in very close co-operation with the subject department.

A number of insights from the Language across the Curriculum movement are incorporated in the total language-subject course emerging. The subject textbook, chosen after joint consultation, is also the major source of reading texts in the language classes.

A number of activities in the subject course are used as inputs for lengthy written productions after further discussion in the language classes. These written assignments are assessed for both the subject and the language courses. The value of writing as an aid towards clarifying learning in the subject area is stressed.

Both courses have been subject to modification of the interdepartmental co-operation. These modifications are enumerated.

A number of examples of materials and of students' work will be discussed.

## 1 INTRODUCTION.

The central recommendation of the Bullock Report (HMSO 1975) explains what "Language Across the Curriculum" means operationally in these words:

> "In the secondary school, all subject teachers need to be aware of:
>
> 1.the linguistic processes by which their pupils acquire information and understanding, and the implications for the teacher's own use of language
>
> 2. the reading demands of their own subjects, and ways in which the pupils can be helped to meet them.
>
> To bring about this understanding every secondary school should develop a policy for language across the curriculum. The responsibility for this policy should be embodied in the organisational structure of the school."
>
> (Conclusions and Recommendations 138, 139. cited Marland 1977:3)

One of the earlier publications in the Language across the Curriculum movement (hereafter 'LAC') was Barnes, Britton and Rosen (1969, revised 1971). This was a Research Report in an L1 situation with an input from the London Association for the Teaching of English and closely associated with work being done at the London Institute of Education. In this early work Barnes reports on the classroom interactions in 12 secondary school classes and Rosen introduces a discussion document on LAC. Britton's article 'Talking to learn' states that we want students

> "as a result of our teaching, to <u>understand</u>: to be wise as well as well-informed, able to solve fresh problems rather than have learnt the answers to old ones..." (Barnes, Britton and Rosen. 1971:81)

Other linguists at London University who were working on English in an educational context at about the same time included Halliday (working on his systemic grammar) and Bernstein (working on elaborated and restricted codes) and throughout the land secondary schools were becoming comprehensives. There was the possibility of some exciting changes in the English secondary schools.

It is possible to trace the fate of the idealism expressed in Rosen's breathless contribution in 1971,

> "We still have ahead of us that crucial and demanding phase of realising in the classroom practice the theories which seem so promising" (Barnes, Britton and Rosen 1971:161)

through the expanded exposition in A language for life (1975) to the follow up in Marland, 1977. Here we find Martin's slightly less optimistic discussion of the operational difficulites of the actual initiation and implementation of an LAC policy, chiefly caused by puzzlement at what an LAC was actually supposed to mean. From the head of departments' reports cited by Martin and from what I know of schools in England, I could understand how such a policy could run into difficulties in its implementation. Martin gives as major areas of difficulty:

1. other departmental heads not seeing LAC as having anything to do with them

   (whereas of course it does. LAC is asking subject departments to look at eg. how often they involve students in class/teacher or group discussions, how much board copying/dictation/essay writing they do, how new technical words are introduced Marland 1977:239))

2. the English department being seen as seeking to interfere with teaching methodologies in other departments or even as empire-building

   (whereas what is being attempted is the application of extensive research findings to improve students' learning in all subjects.)

3. LAC being treated as nothing more than a new solution to the problems of 'remedial English', to be solved by more special English classes

   (whereas there is no suggestion of a deficit theory in LAC.

The movement is concerned with language use, not with good or bad English.)

The reasons for such mis-interpretations may well be because as Martin points out, teachers had never been previously asked to work collectively to achieve syllabus policies, and she comments:

> "How difficult it all seems... How open to rebuff. It is not surprising that teachers who have not thought about the place of language in learning wonder what it is all about." (op cit p234-6).

Let me say right at the outset that at Unitech we do not have an overall LAC policy. We have a Language department servicing ten professional departments in an English medium (ESL) situation. The relations between the language department and the individual subject departments are very cordial and co-operative, but do vary from department to department. (There are still a few staff members (and students) in the University who refer to an 'English department' and who would perhaps consider the Language department's job as concerned with remedying students' grammar and vocabulary problems.)

I would like in this paper to outline some areas and give some examples in which, through very close co-operation with the subject lecturer, we have devised a service language course for first year Communication Engineering students at Unitech. Such close co-operation has been developed over a period of 3 years so that not only can I now eg. request the syllabus of the content subject, but I am, as a matter of routine, consulted on the format of the subject examination questions. Both the subject lecturer and I are of the opinion that this close co-operation between subject and language lecturers provides a better overall learning package for the students concerned: in Marland's words:

> "...if a school devotes thought and time to assisting language development, learning in all areas will be helped: if attention is given to language in the content and skill subjects, language development will be assisted powerfully by the context and purpose of those subjects." (Marland 1977:3)

Without an explicit LAC at Unitech we are going some way towards achieving these same ends.

## 2 BACKGROUND.

### 2.1 CD181

(In fact the code number for this course changed in 1985. It is now coded CD185 in the first semester and CD186 in the second. For brevity I have retained the old number in this paper.)

CD181 is the first year in a 5 year sandwich course leading to a Diploma in Communications Engineering at the Papua New Guinea University of Technology (Unitech). The intake is selected from successful Grade 12 school leavers. This first year course assumes no knowledge of electricity on the part of the incoming students and so starts with a simplified model of the atom (consisting of the three electrically important particles the neutron, the proton and the electron), and ends with the behaviour of ac in circuits containing inductance, capacitance and resistance.

At the end of the second semester the students leave Unitech for some 6 months for Stage II of their course when their training is taken over by their sponsors. This stage is the first industrial experience slice in their sandwich course.

### 2.2 LA134

LA134 is a four hour per week, two semester language course designed to service CD181. Nearly all formal education in Papua New Guinea is conducted in English so the students entering Unitech have a good facility with the formal properties of English. LA134 does not therefore need to spend much time on the grammatical systems of English: instead it works at the rhetorical and discoursal levels and in the area of general study skills. The overall aim is to help students become more efficient students of Communication Engineering in English.

In order to achieve this aim LA134 takes an unashamedly narrow-focus EST approach.

## LINKS BETWEEN CD181 AND LA134.

LA134 works in very close co-operation with the subject course CD181, but this co-operation does not involve team teaching (although a number of other language courses at Unitech do adopt this approach). There has gradually developed a two-way interaction between the two courses. I would like to discuss this interaction under these two very broad rubrics:

1. effects of CD181 on LA134
2. effects of LA134 on CD181.

## 3 EFFECTS OF CD181 ON LA134.

There are effects in the reading, the writing and the speaking tasks set in LA134.

### 3.1 Reading

(Texts are used as inputs to some other activity, writing or discussion. My division here between "Reading" and "Writing" should be understood to reflect a difference in emphasis for the purposes of this paper not a demarcation between activities.) The most used source of texts for LA134 is not an ESP textbook at all but the CD181 subject textbook "Basic Electronics" by B. Grob.

This book was chosen for the CD181 course as a replacement for an earlier text after joint consultations between the two departments, the Language department advising on the readability factors of the text, taking into account not only the simpler mechanical aspects of the readability formulas, but also typography, advance organisers, summaries, cultural references and level of content. (I am developing a computer programme to assist with the mechanics of word and syllable counting and the computation of readability according to several of the standard readability formulas.)

Apart from the use of a subject textbook as the textbook for the EST course, there is nothing very new about the reading component of

LA134: most of the exercise types and exploitations of the text are fairly common practice now in EST courses. I have based most of the reading exercises on Nuttall's (1982) suggestions for teaching "text attack skills" which are grounded in firm theoretical considerations. I have also used the computer as a substitute for physically cutting the text into separate strips, as for example in the 'Tracing and interpreting rhetorical organisation' tasks (Nuttall 1982:107). These require the text to be presented on separate strips, each containing a sentence or paragraph, which are then put into order according to rhetorical, syntatic and semantic considerations. For this I use the computer in a way similar to John's (1981) "Jumbler suite" technique except here I do not use the computer interactively, but as a randomiser and producer of printed texts.

I have often wanted to try an introductory subject textbook as a language-class text book and I feel in this case it is justified. I consider the materials used in an EST course should be matched to the particular students on a 2-way matrix:

1. subject content level of the texts and examples used
2. language level.

No published EST textbook that I know of matches these students on both dimensions of the matrix and I do not think this is a very unusual situation. It is unlikely that there are, at any given time, say 10,000 students world-wide in any specialism at a similar stage in their specialist course who also have a similar English level. Yet these are the kinds of numbers that textbook publishers seem to expect for their ESP publications.

Instead there is frequently a mismatch on one or other axes of the matrix. On the one hand we have the much criticised low content level of the material found in the Nucleus and early Focus series, and on the other, the use for language work of devices not known to the students in the kind of detail required eg. the means by which the oscilloscope trace is focussed in Glendinning (1980:18-19) or the steeply graded content level of McAllister and Madama. This latter book claims to be useful at levels from trade school students to qualified electrical engineers attending conferences. (McAllister and Madama. 1976:vii). It is not possible to match content level and language level to given students without looking at their actual syllabuses in both areas and such matching cannot be achieved on the global scale expected by many of the published ESP textbooks. It is for this reason, I suspect, that so many ESP teachers/course designers write their own materials - the ESP publishers are not able to reconcile the conflict between small scale 'tailor made courses' and publishing house printing numbers.

Using a carefully chosen subject textbook can make the content level and the language level appropriate for the students. If the extracts used in the language classes are carefully synchronised with the topics discussed in the subject course they also become topical for the students. It is unlikely that this topicality could be attained with any ESP textbook.

Apart from the intensive reading work (Nuttall 1982) already mentioned, in LA134 we exploit texts from Grob for:

1. information transfer as a form of notetaking
2. examples of usage (eg. the generic use of "the")

3.1.1 Information transfer.

A considerable number of information transfer tasks are set from this text. In a basic course, such as CD181, considerable time is spent learning about the "n kinds of X" (eg. 3 kinds of resistors, 2 kinds of cells, 7 kinds of capacitors), their characteristics and the differences between the different types. This kind of basic differentiation between fundamental components, so typical of many basic technology courses, offers a good opportunity for transcoding from a text into tables and tree diagrams. Such tables can immediately be used by the students as real ("authentic") notes for their CD181 course.

There is a danger of students becoming experts in the one or two page text with "comprehension questions" so typically handed out in the EFL classroom. What is required is that the students in reading lessons should learn some reading strategies, which can be applied to any subsequent text. Skeletal frameworks are provided on rather longer texts for the students to work on (cf. Nuttall 1982).

3.1.2 Examples of usage.

Usage does not form a large part of the LA134 course. As indicated, PNG University students have already had many years experience of using English and their knowledge of English is good compared with many other EST students around the world. However there are three areas in which I judge specific grammar teaching to be useful:

1. the use of determiners (especially generic "the")
2. the formation and extensive use of the passive
3. the formation and use of relative clauses.

A number of passages from Grob have been identified which exemplify the various uses of determiners, especially "the" for both definite reference and the very common generic use in teaching texts in technology :

eg. The electron has a negative charge.
The ohm is the unit of resistance.

Such passages have been clozed for practice re-insertion.

Other passages have been selectively clozed to give exercises in re-insertion of passive forms, including the very common modal passives:

eg. X may be considered a type of Y
the current can be found by applying ohms' law

Cloze completion is a testing procedure, but the follow up discussion of student insertions offers a learning opportunity.

I have found tables of data, particularly those containing information in a column headed "Notes" to be useful sources of material for practice use with relatives. Students can combine the information given in the columns by reading across the table and incorporating that line of information in sentence length productions.

3.2 Writing.

Just as there has been found more to the reading process than was previously thought, so now the great interest is in re-examining the writing process and producing new models of writing. It is now accepted that in reading there are not given meanings to be extracted from the written text. Similarly there are not, for the writer, only preformulated meanings to be transferred to the paper.

In an earlier paper (Robinson 1981) I cited several writers on ESP (Allen and Widdowson 1974, Mackay and Mountford 1976, Widdowson 1976, Drobnic 1978) who present the view that the job of an ESP/T course is to give students practice in expressing in the FL what they already know and could express in the L1. Students need to acquire facility with English as a linguistic system, in Widdowson's words to:

> "transfer information of various kinds from the context of A's world knowledge to that of B and also to learn that: that various linguistic rules facilitate the transference." (Widdowson 1983:36)

At that time I also cited a number of other authors (Nolasco 1978, Holmes 1979, Cleary 1975, Jones and Roe 1972, Dudley Evans and Swales 1980, Adams-Smith 1979), who suggest that at least some EST students are not in the position of having scientific discourse available in L1, awaiting textualisation in L2. To requote Pauline Robinson (1980):

> "Many students do not have that much knowledge of science, even in their own languages, because it does not exist in those languages. That is why they are learning science in English."

I would suggest that LA134/CD181 students are nearer this second type of student than the first.

Widdowson (1979 and 1980) makes a very strong case for the interactive nature of writing, the "interactive process of negotiation" (Widdowson 1979:39) being "covert and non-reciprocal" and occurring between the writer and himself-as-idealised-reader who prompts himself with such questions as "What do you mean by that? So what? Can you give an example?" (Widdowson 1979:40 and 1980:239). In this way "the propositional content he wants to transmit is elaborated".(1980:239)

This looks to me almost like translating from one language (the discourse) into another (the text), such as a Russian research physicist might engage in before attending an international conference in English. Translation, of course needs to be understood here to be far more than adding one bi-lingual dictionary definition/equivalent to another, just as reading is more than a word-by-word decoding process.

Widdowson is applying communicative language teaching principles to an ESP situation, and I would suggest that this is misguided for the large number of students who are learning all their science through the medium of English as FL. Such students are not packaging already

formed (however crudely) discourse into FL text, (see Henzell-Thomas forthcoming) but are first faced with an earlier task, that of having to formulate the discourse as learners of the concepts and the relations between them.

To be fair, Widdowson does add a few lines in both articles to the effect that the negotiation "can also change the character of the information the writer wishes to convey" (Widdowson 1979:41), but these riders occupy only a few lines in either article. He also cites Chomsky's (Parret 1974) point that the communicative use of language presupposes the ability to use language in the formulation of thoughts (Widdowson 1980). In both these articles Widdowson is doing little more than paying lip-service to the thought-creative aspect ofwriting.

Other researchers into the writing process put the generation of new thoughts much more centrally. In their editorial comments, Bereiter and Scardamalia (op cit:10) point out that there are pervasive differences between Widdowson's model, taken as representative of L2 thinking, and Britton's views, taken as the L1 stand. L1 writing has importance in helping the learner "shape his grasp of the world around him", whereas communicative L2 teaching assumes the language needs are for some 'target' situation. I feel the LA134 students are more like Britton's L1 learners, shaping their thoughts at "the point of utterance" (Britton 1979), than like Widdowson's communicators of information: the interaction for L1 and, I think, LA134 students is between writer and text, not between writer and reader.

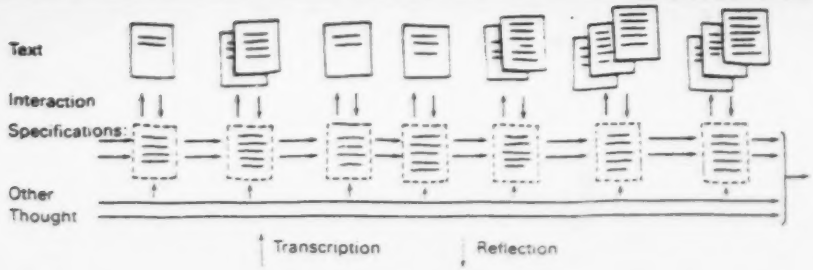
Smith, again refering to the L1 situation, emphasises the role of development of thought in the act of writing:

> "By writing what I think I know, I develop what I potentially knew. Writing does more than reflect underlying thought, it liberates and develops it... it is a superb instrument not only for exploring the potential of thought but for developing it as well." (Smith 1982:33, 34).

His whole last chapter speaks of the elaboration of his own thinking that came about while he was writing the book, and he specifically states:

> "I have long believed it to be a distortion and an oversimplification to characterise writing (and other aspects of language) as 'communication' and 'information transmission'.(Smith 1982:214)

Smith offers the following model of the writing process, which makes clear the interaction of new thoughts and the writing.




Smith speaks of the writer's thoughts as being 'intentions' which constitute "a specification of what the text will be like" (op cit:117). This specification is subject to constant development in the light of the written text Smith's model shows a complex of interactions between thought, reflection, intentions/specifications and drafts of the text. This seems to me to be a more accurate model of the writing process than Widdowson's Socratic self questioning (Widdowson 1980:239). Smith accounts for creative thought generation: Widdowson merely text expansion.

Smith draws the analogy between the painter and the writer: the painter does not plan each brush stroke before he starts painting - the image in the painter's mind develops with each brush stroke. So for the writer new thoughts, concepts and the relationships between them are developed through the medium of writing.

Perhaps we could contrast Widdowson's and Smith's views in terms of the 'low road' and the 'high road' solutions L1 students have with the problems of writing, as characterised by Bereiter and Scardamalia (1979, in: Freedman et al 1983:29-31). The high road leads to mastery and the use of writing towards "advancing one's own thinking" whereas the low road leads to "knowledge telling" as if writing

> "consists essentially of selecting a memory file appropriate to the task and telling what is in it" (op cit 29)

and is

> "seeing it as nothing more than a communication skill" (op cit 31).

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Students of techonology need to be more than just repositories of facts, they need to be able to apply the principles derived from their technical knowledge in new situations. A starting point towards that end is the consolidation of learning that comes through the manipulation of concepts in writing. That is why the writing component of LA134 encourages the production of longer passages so there is room for students themselves to discover the internal relations between sections of the texts they produce.(see report writing below.)

There is room also for shorter written texts. For example the tables that were drawn up under the familiar information transfer exercises refered to above, can at a later stage be exploited in LA134 for text writing tasks. These reconstitutions from tabled notes serve several purposes:

1. the column heading in the tables can be used as section headings in the text, thus giving students practice in using ample sub-headings in their own texts. It is this lack of organisers ("signposts") that often causes students to produce badly organised or incoherent written discourse

2. the finished products can incorporate additional information learnt subsequently in the CD181 course or from other textbooks, ie. the textbook is not the only (or even necessarily the best) source of information for the students at any particular stage of learning. This is a valuable lesson.

3. the reconstitution acts as a useful form of revision for the students, particularly when timed to occur just before a progress test in CD181. Composing a coherent text from a set of notes some time after the original notes were made is one of the most important skills an efficient student needs to learn.

4. the products can be shown to the CD181 lecturer as feedback on the quality of the students' learning of that topic.

3.3 Speaking.

The major speaking assignments (1 in each semester) in LA134 are the giving of 'lecturettes' (P. Hines 1978) by students. This task practises a number of skills:

1. the topic of the talk has to be researched in the University Library (involving catalogue and retrieval, reading and note-taking skills)

2. the selection and organisation of OHP transparencies

3. the oral presentation itself usually given before the VTR camera for feedback purposes.

Great emphasis is given to the careful organisation of the material presented. In addition the task goes some way towards helping the students speak more clearly, a widespread request from subject colleagues in the University.

## 4 EFFECTS OF LA134 ON CD 181.

LA134 therefore exploits opportunities within the CD181 course for the production of written texts. These written assignments are marked both for LA134 and CD181 assessments.

1. full lab reports
2. reports on visits
3. explanation of a device

### 4.1 Full lab reports.

Every week CD181 students attend a lab in which the topic of the theory classes is subjected to practical investigation. The purpose of these labs is to reinforce the theoretical learning. The normal CD181 lab sheet gives the student guidance in what equipment is necessary and how to set it up, what measurements to make, a predrawn table in which

to enter the results and some follow up questions to be answered (in short form) together with some relevant calculations and/or a graph to be drawn.

LA134 has now taken 2 of these labs in each semester and requires the students to write a full lab report, ie. to compose about four pages of writing under the standard headings:

1. Aim
2. Equipment
3. Circuit diagram
4. Procedure
5. Results (/graph)
6. Conclusion
(7. Calculations.)

These reports are then assessed once for CD181 and again, separately, for LA134.

The first time we tried this assignment, we used the standard lab sheet and asked students to write the reports on lined paper. The results were disappointing because the normal lab sheets give most of the information required (except the Results) and, not surprisingly, students copied much of their reports from the original lab sheets - a not very pedagogically fruitful assignment. A second lab was then selected for a revised treatment. I went to the laboratory with the normal lab sheet and performed the lab myself. From my experience with this lab I then rewrote the lab sheet in such a way that the students would not be able to copy out sections when writing their full lab report. I purposely wrote the revised sheet in an unacceptable register (Today we are going to use the oscilloscope to have a look at some of the effects of inductance in a dc circuit) and left students to draw up their own tables of results. The Equipment was not all listed in one place, but mentioned at separate stages as items became necessary for the next stage in the lab. The Conclusion section was left as a series of prompting questions-to-be-answered.

This new lab sheet was introduced in the LA134 class and indications were given as to what would be expected in the assignment. From the resulting lab reports the CD181 lecturer was able to see areas of uncertainty in the students' learning and could deal with these in his follow up. In the LA134 class I was able to deal with language problems (eg. formation of past passive) and organisational problems (eg. whether the various stages of the lab should be recorded in a temporal sequence:

| | | |
|---|---|---|
| Equipment 1 | | Equipment 2 |
| Procedure 1 | followed by: | Procedure 2 |
| Results 1 | | Results 2 |
| Conclusion 1. | | Conclusion 2 |

or by topic:

Equipment 1,2,3
Procedures 1,2,3
Results 1,2,3
Conclusion 1,2,3.)

There are now 4 such lab sheets available for the first year students. It is unlikely that every weekly lab would be treated in this was because of the enormous amount of extra marking a full lab report requires. However, I see the writing of a full lab report as a valuable learning experience. Britton (1977) thinks it better for schoolchildren to be able to write about their lab experiences in their own style rather than in the standard format. However I believe that even within the standard format there is room for a student to practise "expressive" (Britton 1977) writing at least in the Conclusion section of a formal report. Students at the CD181 level are not really in a position to state as a Conclusion baldly that "Thus Ohm's Law is proved correct". Instead the Conclusion is an opportunity for the student to make an explicit statement about what they have learnt by relating Aim to Results should do so, eg. "From the Results (see Table 1) it can be seen that when the applied voltage is doubled, the current in the circuit also doubles. Table 2 shows that when the circuit resistance is doubled, the current is halved. These results agree with Ohm's Law." Such a Conclusion (idealised perhaps in my example) is not a sterile restriction on the students' writing, but an opportunity for perhaps more careful thought about the significance of what they have been doing in the lab.

4.2 Reports on visits.

CD181 is a sandwich course and during the first year at Unitech students are expected to acquire a sponsor for the industrial experience periods of the course. In order to help the students decide which of the three major parastatal sponsors they would like to work with (National Broadcasting Corporation, Post and Telecommunications Corporation or the Office of Civil Aviation) the first year students pay visits to these institutions for a guided tour. The students are

required to write a site-visit report on each of these tours. To help the students produce these reports, the first such reports they have probably ever done, guidance is given in the LA134 classes on the likely headings within the report.

4.3 Explanations of a device.

A device whose workings are dealt with in some detail in CD181 is the moving-coil meter. This device works on electrical, magnetic and mechanical principles which can be treated at a level which these first year students can comprehend. In LA134 we use this device as a paradigm for a description, both static and dynamic, of a device. The sources of input to this assignment are:

1. students' own lecture notes from CD181
2. the textbook
3. a number of texts on the device from other sources
4. an LA134 worksheet
5. examination of examples of the device on the table
6. other drawings of the mechanism
7. other students in the group

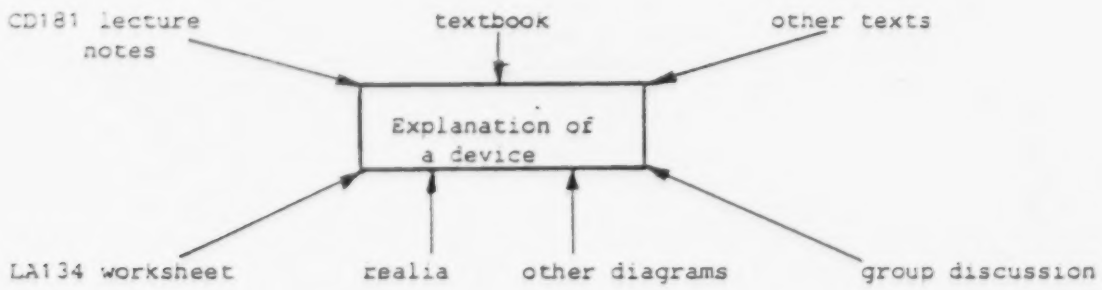


Fig. 2. The inputs to the written explanation of a device.

This exercise is one of the most successful I have devised. Students really do sit round the table in groups and examine the device, compare it with their lecture notes and the alternative drawings, and check various details against the alternative texts available. From all these inputs they are able to synthesise a full

length description of the device, again for submission to both LA134 and CD181.

4.4 Exam questions.

The examinations in CD181 have become increasingly "wordy" both in the questions set and in the answers expected. The transcoding from the verbal description of the problem to drawing the circuit diagram is linguistically, and probably conceptually, the most difficult part of the problem. Once the problem is in the form of a circuit diagram with the known quantities marked and the unknown quantities clearly indicated, the problem requires only the almost automatic application of the relevant equation and subsequent calculation.

An interesting teaching strategy I hit upon here is to ask the students themselves to compose some similar examination questions. We found the students rapidly acquire facility in this register and, when these questions are passed to other students to answer, the students soon improve in their ability to transcode from the verbal statement to the circuit diagram. (In a University-wide study of examination questions a colleague in the department, Colin Barron, found that a large number of the questions set required the composition of a text rather than an almost wordless calculation eg. questions starting "Explain how..." "Describe") (Barron 1984)

## 5 CONCLUSION.

Language across the curriculum started as a movement in UK, arising from the investigations by Barnes, Britton and Rosen (1969, revised 1971) into the use of language in subject classrooms. Their book contains not only examples of the "chasm" between the language of pedagogy and the students' use of language but also some early proposals by the London Association of English Teachers (in Rosen's contribution) for a way forward. Following these investigations into classroom interaction, schools were required, via the "Bullock Report", to produce a policy on LAC.

Policies do not necessarily produce co-operation between affected parties. Without co-operation between departments and lecturers, the insights the LAC movement was trying to implement will produce less than optimal results.

The degree of across-the-curriculum co-operation between

individual lecturers that I have been discussing here has enabled us to offer the students the benefits of some of the insights from the LAC movement. I hope other langauge teachers might find something of interest in their own situations from what I have said.

## 6 ACKNOWLEDGEMENTS

I would like to record my gratitude to Gordon White of the Department of Communication Studies at Unitech for his kind co-operation in the course outlined here.

Limbie Kelegai of the Computer Centre, Unitech, was most helpful in writing the word and syllable counting programme I used in the readability studies. Peter Sullivan, at one time a Lecturer in the Mathematics Department, Unitech, wrote several text scrambler programmes for me. My thanks to both for their work and interest in these problems.

I would also like to thank Jeremy Henzell-Thomas for both the many fruitful discussions we had during my preparation of this paper and for his helpful comments on an earlier draft. The remaining omissions and errors of judgement are of course my responsibility.

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